CHAPTER VII
FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

This study is related with the supply chain management and productivity of private sector industries in Nasik district. It highlights the various facts and figures about supply chain management and productivity in private sector industries.

The supply chain management is the soul for all size and type of industries. Productivity, quality, service, price, rewards, financial and non-financial benefits and career planning are completely depended upon the supply chain management system. The supply chain management becomes directive process for the manufacturing and non-manufacturing industries. The level of integration and management of an industrial productivity link is a function of the number and level, ranging from low to high, of components added to the link. As a result, adding more management components or increasing the level of each component can increase the level of integration of the industrial productivity link. The literature on productivity re-engineering, buyer-supplier relationships and SCM suggest various possible components that must receive managerial attention when managing supply relationships. Lambert and Cooper have shown the components for managing supply chain such as Planning and control, Work structure, Organization structure, Product flow facility structure, Information flow facility structure, Management methods, Power and leadership structure, Risk and reward structure, Culture and attitude.

In the present study, an effort is being made by the researcher to observe the actual performance of various tools of SCM and its impact on the productivity of private sector industries in Nasik district with the help of
managerial level respondents. Though the study is confined to Nasik district, the suggestions offered could prove to be useful in similar circumstances prevailing in other districts in Maharashtra and national level also.

This chapter aims to give the vivid outline of the precise attempts, accounting at what extent the varied objectives of the present study have been accomplished and whether the hypotheses are proved to be true. Before putting up the findings, conclusions and few recommendations on table, the detailed and proactive study can be summarized as follows:

**Chapter I:** This chapter deals with the concept, history and development of supply chain management. As well as a brief review of the levels of supply chain management and productivity with reference to Asian countries including India. It also includes meaning, scope, needs, significance and scenario of private sector industries in India.

**Chapter II:** This chapter is about the research methodology, which describes the topic, objectives and hypotheses of the research. The following listing has been set out as the objectives of the study, which served the purpose of the lighthouse.

**Objectives:**

a) To study the productivity of Large scale private sector industries in Nasik District.

b) To study the various tools of supply chain management in Large scale private sector industries in Nasik District.

c) To study the issues of supply chain management in Large scale private sector industries in Nasik District.

d) To suggest remedial measures or solutions to remove the drawback of supply chain management.

e) To suggest suitable tools of supply chain management for improvement in industrial productivity in Large scale private sector industries in Nashik District.
In order to fulfill the above objectives, the following hypotheses were formulated for testing.

**Hypotheses:**

a) Supply chain management has a significant impact on cost savings and revenue improvement.

b) Effective supply chain management and Industrial productivity are positively interrelated.

c) Industrial infrastructural environment in Nasik is suitable for improvement in Industrial productivity through supply chain management.

d) Productivity improvement and customer satisfaction are the driving forces behind many supply chain initiatives.

Along with this, the chapter also includes the review of literature, research design, data collection, the techniques of analysis and limitations of the study.

**Chapter III:** It presents the different practices of supply chain management. This chapter also includes elements and drivers of supply chain management as well as a few cases on Supply Chain Management.

**Chapter IV:** This chapter deals with the information of different practices of supply chain management in private sector industries in Nasik District.

**Chapter V:** This chapter presents the role of supply chain management in industrial productivity in private sector industries of Nasik District.

**Chapter VI:** This chapter deals with the analysis and interpretation of the collected data received from managerial level respondents of selected forty eight industries. The hypotheses are examined in this chapter.
Chapter VII: This chapter deals with the Findings, Conclusions and the Recommendations.

These Findings, Conclusions and Recommendations are as below:

7.2 FINDINGS

The researcher is happy to put on record the findings drawn from the various surveys conducted by the researcher at the selected industries and the information given by their managerial level staff. These are as follows:

7.2.1 The position of the private sector industries in Nasik district

The researcher had selected forty eight private sector industries. Out of these, twenty four industries were from excellent effective SCM industries while twenty four industries were from feeble effective SCM industries. (Refer Table no.2.2)

7.2.2 Establishment of the industries

It is observed that during the fifteen years period of 1986-2000, nearly 45% of the industries were established as compare to the total industries in the district. Nearly 31% of the industries were established before the year 1985 while 24% of the industries were established after the year 2000. (Refer Fig.no.4.1)

7.2.3 Employees classification of the industries

It is observed that the researcher had selected four categories of respondents from the managerial level, which is shown below.

a) Works manager - 48
b) Production manager - 48
c) Purchase manager - 48
d) Maintenance manager – 48

Total = 192
7.2.4 Sexual classification of the respondent employees

Out of 192 respondent managers 186 (96.88%) respondents are the males while only 06 (3.12%) are the female respondents in the managerial level of industrial employees. Therefore in private sector industries in Nasik district, male managerial employees are dominant than female managerial employees due to social structure of the Indian society. (Refer Table no.6.1)

7.2.5 Age structure of the respondent employees

Out of 192 respondents, the majority of managerial employee’s age ranges between 25-60 years (162 i.e.84.4%). On other hand, less than 25 year and the above 60 years employees are 15.6% i.e. 30 employees. Hence, the age group of 25-60 years employees playing dominant role in private sector industries in Nasik district. (Refer Table no.6.1)

7.2.6 Marital status of the respondent employees

In private sector industries, the maximum numbers of managers i.e.153 (79.7%) are married because of their self dependency and remaining 39 (20.3%) are from Un-married, Widowed, Divorced, Separated. (Refer Table no.6.1)

7.2.7 Religious structure of the respondent employees

Out of 192 respondents maximum respondents belongs to Hindu religion i.e. 98 (51.0%) while the least share is from the Muslim religion, which is 10 (5.2%). Therefore, Hindu religion is playing a dominant role as a managerial level in private sector industries in Nasik district. (Refer Table no.6.1)

7.2.8 Education structure of the respondents employees

The private sector industries in Nasik district are accepting the more managers with managerial skill i.e. MBA (31.8%) for efficient and effective operating of the industries which improves the productivity of the industries
while 26.0% as graduates like BE, 25.5% as Post graduates like ME, 9.4% from the others professions related to the industrial sector and only 7.3% are non graduates.

(Refer Table no.6.1)

7.2.9 Acceptance of managerial techniques

Automobile industries are at 1st rank i.e.20 (83.4%) for accepting management techniques as effective techniques while managing their industries. On the other hand Construction industries are at last i.e.12 (50.0%), which is not having that much faith on management techniques.

(Refer Table no.5.1)

7.2.10 Significant change due to SCM

The Luggage industries i.e.22 (91.7%) has significant change with the help of SCM for managing their industries while on the other hand Construction industries i.e.13 (54.2%) are not having that much impact of SCM. It means SCM is not so effective in construction industries.

(Refer Table no.5.2)

7.2.11 Rank of the industries in case of functional series of raw material stages

In case of functional series of raw material stages, the Automobiles industries are at rank 1st while Agro base industries rank is last according to the opinion of respondents which ranging between lowest 13 (54.2%)to highest 21 (87.5%). (Refer Table no.5.3)

7.2.12 Rank of the industries in case of potential for either its suppliers or its customers to become a partner

In case of potential for either its suppliers or its customers to become a partner, the Automobiles industries are at rank 1st while constructions
industries rank is last according to the opinion of respondents which ranging between lowest 14(58.4%) to highest 23(95.9%). (Refer Table no.5.4)

7.2.13 Rank of the industries in case of grouping of management functions supporting the complete cycle of material flow

In case of grouping of management functions supporting the complete cycle of material flow, the Luggage industries are at rank 1st while Construction industries rank is last according to the opinion of respondents which ranging between lowest 14(58.4%) to highest 23(95.9%). (Refer Table no.5.5)

7.2.14 Rank of the industries in case of integrating the customer into the management of the supply chain has numerous advantages

In case of integrating the customer into the management of the supply chain has numerous advantages, the Automobiles industries are at rank 1st while Agro base industries rank is last according to the opinion of respondents which ranging between lowest 13(54.2%) to highest 23(95.9%). (Refer Table no.5.6)

7.2.15 Rank of the industries in case of SCM integration improves the flow of information throughout the supply chain

In case of SCM integration improves the flow of information throughout the supply chain, the Automobiles industries are at rank 1st while Agro base industries rank is last according to the opinion of respondents which ranging between lowest 13(54.2%) to highest 22(91.7%). (Refer Table no.5.7)

7.2.16 Financial turnover of category of industries

In case of financial scenario of private sector industries in Nasik district, the Automobiles and construction industries shows the heavy turnover i.e. 47 % of the total turns over than remaining 6 categories of the industries share is 57 %. It is proved that there is the increasing trend of financial
position of industries, because of effective implementation of SCM practices. As per the observation of analysis construction industries are not have that much faith on SCM practices, but still their turnover is high because of potential of Nasik district regarding construction field. (Refer fig. no.5.8)

7.2.17 Product characteristics of industries

In the present study, Nasik district scenario is favorable for the agro based industries in terms of make to stock characteristics. Automobiles industries supply chain performing on the basis of assemble and engineer to order. Pharmaceuticals & Chemical industries are performing on the basis of engineer to order. Construction industries are performing SCM on the basis of make to stock. Electricals & Electronics industries are performing SCM on the basis of make and assemble to order, Engineering & Fabrication industries are performing SCM on the basis of make to order, Luggage industries are performing SCM on the basis of assemble to order, and Others industries are performing SCM more or less equally on the basis of industrial characteristics. Productivity role in the private sector mainly plays by the above aspects. (Refer Table no.5.9)

7.2.18 Process characteristics of industries

Most of the Agro based industries prefer process type manufacturing system. Automobile industries prefer job, batch and mass manufacturing system. Pharmaceuticals & Chemical industries prefer batch and process manufacturing system. Construction industries prefer project and job manufacturing system. Electricals & Electronics industries prefer job and process manufacturing system. Engineering & Fabrication industries prefer project manufacturing system. Luggage industries prefer mass manufacturing system. (Refer Table no.5.10)
7.2.19 Status of market potential

In excellent effective SCM industries, domestic market have maximum share followed by national market and international market also have good share as compare to feeble effective SCM industries except construction industries. As per overall analysis national market still requires to increase. (Refer Table no.5.11)

7.2.20 Effect of SCM functions

It shows that almost all the industries positively significant with the functions of SCM. Excellent effective industries by SCM function represent nearly 90 % positive responses while Feeble effective industries by SCM represent nearly 70 % positive responses regarding flow of information improves by the SCM functioning. (Refer fig. no.5.13)

7.2.21 Status of productivity of industries

Out of 192 respondents, 58 respondents i.e.30.2% of average respondents are giving higher importance to Labour productivity while least importance given by only 4 respondents i.e.2.1% of average respondents, 68 respondents i.e.35.4% of average respondents are giving higher importance to Material productivity while least importance given by only 12 respondents i.e.6.3% of average respondents, 56 respondents i.e.29.2% of average respondents are giving higher importance to Capital productivity while least importance given by only 28 respondents i.e.14.6% of average respondents, 77 respondents i.e.40.1% of average respondents are giving higher importance to Power productivity while least importance given by only 21 respondents i.e.10.9% of average respondents.

Therefore, each and every type of productivity has great importance to improve the overall productivity of private sector industries in Nasik district. (Refer Table no.6.3)
7.2.22 Status of problems faced by industries

As per the analysis, serious problem faced by industries is labour problem i.e.18.4% of opinion respondents as compared to other problems while the public relation problems in serious sense are faced by only 5.3% respondent.

Therefore, the labour is the major problem which is solved by better labour management with right time sharing of required information as well as provides better communication facilities to the staff in the industries, better leadership, making better decision regarding all aspect of organization and maintaining better public relations. Hence, this will improve the productivity of industries. (Refer Table no.6.4)

7.2.23 Status of SCM functions

In case of efficient and effective SCM operation, the private sector industries in Nasik district have more faith on following functions:
E- Procurement – 75.5%, Outsourcing – 72.9%, Supply chain Benchmarking – 72.9%, Few suppliers – 80.2%, Use of external consultants – 81.3%, Electronic data exchange – 75.0%, Quality management system – 85.4%.
Therefore, there is a scope for other functions which is used in rare manner. (Refer Table no.6.5)

7.2.24 Awareness of SCM functions

Out of 192 respondents, the highest 167 i.e.87% of average respondents are agree to the supply chain is the distribution of finished goods to the customers while the lowest 98 i.e. 51% of respondents are agree to the supply chain is the chain of suppliers to customers through focal organization. Therefore, private sector industries in Nasik district have awareness regarding functions of SCM which is helping to improve the productivity. (Refer Table no.6.7)
7.2.25 Rank of different tools of SCM

As per analysis, the private sector industries are more interested to implement Capacity Requirement Planning as a 1st rank while least faith on Six Sigma as a last rank. The rank of DRP and E-commerce is 2nd, followed by MRP-I, MRP-II, ERP, SRM, CRM and EDI, APS, 5’S and Bar coding, WMS, TQM, JIT, RFID.
(Refer Table no.6.9)

7.2.26 Status of SCM

Overall the status of SCM in private sector industries in Nasik is varying between fair to very good. But still there is failure and poor status of SCM in industries. Therefore, there is scope for improving the status of SCM by implementing the practices of SCM in efficient and effective manner.
(Refer Table no.6.10)

7.3 CONCLUSIONS

Following are the Conclusions of the study:

7.3.1 Supply chain management has a significant impact on cost savings and revenue improvements was the first hypothesis of the study. The researcher has utilized chi-square statistical method to test this hypothesis. According to this method, calculated $X^2$ value is 14.88 while the table value of $X^2$ at 5% l.o.s. is 7.815.

Therefore, this hypothesis is proved. It means supply chain management has a significant impact on cost savings and revenue improvement.
(Refer table no.6.7)

7.3.2 Effective supply chain management and Industrial productivity are positively interrelated was the second hypothesis of this study.
The researcher has utilized chi-square statistical method to test this hypothesis. According to this method, calculated $X^2$ value is 10.13 while the table value of $X^2$ at 5% l.o.s. is 7.815.

Therefore, this hypothesis is proved. It means SCM is playing a dominant role in improving industrial productivity. (Refer table no.6.8)

7.3.3 Industrial infrastructural environment in Nasik is suitable for improvement in Industrial productivity through supply chain management was the third hypothesis of this study.

The researcher has utilized chi-square statistical method to test this hypothesis. According to this method, calculated $X^2$ value is 4.86 while the table value of $X^2$ at 5% l.o.s. is 7.815.

Therefore, this hypothesis is disproved. It means industrial infrastructural environment in Nasik is not suitable for improvement in Industrial productivity through supply chain management as well as there is no relationship between industrial infrastructural environment and industrial productivity. (Refer table no.6.9)

7.3.4 Productivity improvement and customer satisfaction are the driving forces behind many supply chain initiatives was the fourth hypothesis of this study.

The researcher has utilized chi-square statistical method to test this hypothesis. According to this method, calculated $X^2$ value is 10.52 while the table value of $X^2$ at 5% l.o.s. is 7.815.

Therefore, this hypothesis is proved. It means productivity improvement and customer satisfaction are the driving forces behind many supply chain initiatives. (Refer table no.6.10)
7.3.5 The industries which are having the SCM techniques have higher productivity than the industries where there is lack of SCM practices.

Industrial productivity was studied by the researcher according to the categories of industries like Automobiles, Luggage, Electricals & Electronics, Chemical & Pharmaceuticals, Engineering & Fabrication, Agro base, Construction, and Other industries. The highest productivity (80.8 %) is achieved by Automobile sector industries, since excellent supply chain management industries in this sector are 88.9 % while feeble supply chain management industries are 72.8 %. Then productivity in Luggage industries (Excellent 83.0 % and Feeble 60.8 %), Electrical & Electronic (Excellent 82.9 % and Feeble 64.6 %), Pharmaceutical & Chemical (Excellent 75.2 % and Feeble 65.8 %), Engineering & Fabrication (Excellent 72.5 % and Feeble 68.7 %), Other industries (Excellent 66.6 % and Feeble 48.6 %), Agro base industries (Excellent 63.8 % and Feeble 36.5 %), and lastly the lowest productivity shown in construction industries is 40.6 %. (Refer Table no.5.14)

7.3.6 Following are the various tools utilized by industries in Nasik district for smoothness of supply chain management.

- Material Requirements Planning (MRP-I)
- Enterprise Resource Planning (ERP)
- Total Quality Management (TQM)
- Capacity Requirement Planning (CRP)
- Warehouse Management System (WMS)
- Suppliers Relationships Management
- Just In Time (JIT)
- Bar Coding
- Electronic Data Interchange (EDI)
- Manufacturing Resources Planning (MRP-II)
- 5’S System
- Six Sigma
- Distribution Requirement Planning (DRP)
- Customer Relationships Management (CRM)
- Advanced Planning System (APS)
- Lean manufacturing system
- Radio Frequency Identification (RFID)
- Third party logistics (3pl)
Almost all the above tools are used in Automobile Sector industries and the least use is found in Construction and Agro Industries. Among automobile industries- Mahindra & Mahindra Ltd, Nashik, Mahindra & Mahindra Ltd, Igatpuri, in chemical industries- Seagram Distilleries Pvt. Ltd., Glaxo smithline, in electronics & electrical industries- Scheinder electric Pvt. Ltd., ABB Ltd., Crompton Greaves ltd, in Luggage industries-Samsonite South Asia Pvt. Ltd., VIP ind. Ltd are the most important industries.

7.3.7 Following are the drawbacks of Supply Chain Management in private sector industries in Nasik District while implementing SCM practices.

- Resistance to change from employees.
- Skill shortages.
- Hidden cost.
- Resources shortages.
- Insufficient vendor support.
- Lack of Integration with the existing system.
- Lack of Integration with customers’ system.
- Poor public policy regarding SCM.
- Lack of Closer co-operation among companies.
- Lack of Integration with suppliers system.
- Lack of infrastructure facilities available in Nasik district.
- Lack of easier access to vocational training.
- Lack of Integration with customers’ system.

Therefore, if we want to improve industrial productivity with the help of Supply Chain Management, the solution to above drawbacks is essential.
7.4 RECOMMENDATIONS

On the basis of the data analysis and interpretation accounted in the previous chapters as well as the findings and the conclusions drawn by the researcher, the following recommendations are made by the researcher for consideration of the private sector industries in Nasik district to improve their productivity:

7.4.1 Supply Chain Management is playing an important role in cost saving and revenue improvement. Therefore, this system should be adopted by each and every industry to save the cost and improve the revenue not only in Nasik district but all over the Country.

7.4.2 As effective supply chain management and Industrial productivity are positively interrelated; therefore, each and every industry should use SCM system in efficient and effective manner for positive effect on productivity.

7.4.3 According to our study, though the industrial infrastructure environment and industrial productivity are inversely related with each other, but better industrial infrastructural environment is suitable for improvement in Industrial productivity through supply chain management; therefore, central and state government as well as local government of Nasik should develop the infrastructural facilities which are required for industrial development for improving their productivity.

7.4.4 As productivity improvement and customer satisfaction are the driving forces behind many supply chain initiatives; therefore, each and every industry should try to improve their productivity through effective SCM system as well as try to satisfy their customers by providing quality products at reasonable price and comfortable service with the help of better SCM system.
7.4.5 At present some tools are utilized by the industries and their productivity is higher; therefore, other industries should try to utilize the some necessary tools as well as they should try to find out some new tools and techniques in this regards.

7.4.6 At present some issues or drawbacks are presents in industries which affects adversely on their productivity; therefore, each and every industry should try to overcome these drawbacks for effective implementation of SCM practices.

7.4.7 Nasik district industries should try to use the following practices in efficient and effective manner for removing the drawbacks which are hurdles for improving productivity:

Provide better managerial education, Provide easier access to vocational training, Provide easier funding & financial support, Provide better facilities inter-country regional agreement, Provide better infrastructure, Provide better improved information sharing provision, Provide better facilities for increased regional co-operation, Provide closer co-operation between companies, Provide better public policy regarding SCM, Provide awareness programme for improving employees skill and positive thinking regarding work culture.

7.4.8 Following are the various tools which are to be used by industries in Nasik district as well as other places for smoothness of supply chain management:
MRP-I, MRP-II, ERP, 5’S System, TQM, Six Sigma, CRP, DRP, WMS, CRM, JIT, APS, LEAN, Bar Coding, RFID, EDI, 3pl,4pl etc.
7.4.9 As manufacturing costs, material costs, transportation costs, and inventory costs are basically depend on flow between the facilities of Supply Chain by supplier, manufacturer, distribution centers, and customers; therefore, each and every industry should try to create the awareness by managers in case of SCM.

7.4.10 In Nasik district private sector industries should need to improve master scheduling which improve the productivity. Industrial psychologists contribute to an organization's success by improving the performance and well-being of its people. Hence, every industry should improve their behaviors and attitudes through hiring practices, training programs and feedback systems.

7.4.11 As male managerial employees are dominant than female managerial employees due to social structure of the Indian society. Therefore, each and every industry has a responsibility to appoint the female mangers to maintain the social balance in society as females are more sincere, punctual than males.

7.4.12 As Hindu religion is playing dominant role as a managerial level in private sector industries in Nasik district and Muslim is having very least participation at managerial level. Hence, there is need to create the awareness about the management education in Muslim religion for maintaining the balance in society.

7.4.13 As the private sector industries in Nasik district are accepting the more managers with managerial skill i.e. MBA (31.8%) for efficient and effective operating of the industries which improves the productivity of the industries. Hence, state government and local government should create the awareness about the management education in society.
7.4.14 As per the findings of the study with reference to different category of industries, there is a need to create the awareness about the functions of SCM in Agro based and Construction industries in Nasik district.

7.4.15 As per market analysis of different private sector industries in Nasik district, the industries should develop their National and International market with the help of efficient and effective SCM system.

7.4.16 As the private sector industries in Nasik district generally more aware about the MRP-II (68.8%), ERP (65.6%), CRP (63.0%), DRP (73.4%), CRM (70.8%), SRM (72.9%) practices as compare to other known practices while the industries don’t have that much faith on MRP-I, 5’S, Six Sigma, WMS, APS, JIT, E-Commerce, RFID, EDI, Bar Coding. Therefore, industries should aware their managerial employees as well as other field employees regarding SCM practices for utilization. (Refer table no.6.8)